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UREDINALES OF PORTO RICO BASED ON COLLECTIONS BY F. L. STEVENS¹

J. C. ARTHUR

(Continued from page 196)

36. *UROMYCES PIANHYENSIS* P. Henn. *Hedwigia* 47: 266. 1908.

ON CARDUACEAE:

Wedelia reticulata DC., San German, Dec. 8, II, 4697.

Although only uredinia are available in the Porto Rican material, yet they agree so exactly with the species described by Hennings from Brazil that no question of identity can be entertained. The type collection was made by E. Ule 3329, in January, 1907, on an undetermined species of *Wedelia*. The portion of the leaf of the type collection, which has been examined, shows the same peculiar hairs along the veins, and in general has the same appearance, as the Stevens' collection, except that it is of a less firm texture, indicating a close relationship if not identity of host species.

The urediniospores may be described as globoid, or often triangular-obovoid, 18–21 μ in diameter, the light chestnut-brown wall closely and finely echinulate, thin, 1.5 μ or less thick, with pores indistinct, but probably 2 and equatorial.

37. *Puccinia Cameliae* (Mayor) comb. nov.

Uredo Cameliae Mayor, Mem. Soc. Neuchat. Sci. 5: 578.
1913.

ON POACEAE:

Chaetochloa setosa (Sw.) Scribn. (*Setaria setosa* Beauv.),
Mona Island, Dec. 20, 21, 6118.

This collection shows both uredinia and telia. The species, showing only uredinia, was detected on a phanerogamic specimen in the herbarium of the New York Botanical Garden on

¹ Continued from MYCOLOGIA 7: 196. 1915.

C. scandens (Schrad.) Scribn. (*S. scandens* Schrad.) collected by Brisbane in Jamaica, Oct., 1896. Both the host of the latter specimen and that of the type of Mayor's *Uredo Cameliae* have been examined by Prof. A. S. Hitchcock, and the two pronounced identical.

Mayor's type collection was made at Camelia, a coffee plantation near Angelopolis, U. S. of Colombia. It has been possible, through the kindness of Prof. E. W. D. Holway, to examine some of the type collection. Most unexpectedly an abundance of telia were found, although they have not been mentioned by the author of the species. It is possible that they were overlooked, because they form small, inconspicuous sori, with spores so firmly pressed together, that the usual method of examination by scraping generally fails to discover them. They need to be studied by sectioning the leaf.

It is possible from type material to supply the following diagnosis:

Uredinia amphigenous, scattered, elliptical, small, 0.5 mm. long, rather tardily naked, cinnamon-brown; urediniospores ellipsoid, 15–21 by 19–28 μ ; wall pale yellow to nearly colorless, thin, about 1 μ , closely and very finely echinulate, the pores obscure, 6–8, scattered.

Telia amphigenous, scattered, oblong or linear, 0.3–0.5 mm. long, blackish brown, long covered by the epidermis; teliospores firmly compacted together, oblong to cylindrical, small, 10–16 by 32–39 μ , truncate or rounded at both ends, or sometimes narrowed below, slightly or not constricted at the septum; wall chestnut-brown, thin, about 1 μ , darker and somewhat thicker above, 3–5 μ ; pedicel very short, usually not seen.

38. PUCCINIA CENCHRI Diet. & Holw. Bot. Gaz. 24: 28. 1897.

ON POACEAE:

Cenchrus echinatus L., Guanica, Feb. 3, 339; Mona Island, Dec. 20, 21, 6277.

Cenchrus viridis Spreng., Guanica, Feb. 1, 351; Guayama, Dec. 4, 5338.

The host of the collection from Mona Island was first pronounced by Prof. A. S. Hitchcock to be *C. viridis*. Upon learning from Dr. N. L. Britton that this host was not known from

Mona Island, although a specially thorough phanerogamic survey of the island has been made, the scanty material submitted by Dr. Stevens was gone over by Dr. Britton and Mr. Nash of the New York Botanical Garden, and again reviewed by Prof. Hitchcock. Prof. Hitchcock writes, Feb. 18, 1915: "I have reexamined it, and from the specimen itself I am inclined to think it may be *Cenchrus viridis*, but from the evidence which you present and the fragmentary condition of the specimen I think it best to let it stand as *Cenchrus echinatus*. The two species are closely allied, and one could not state with certainty from the fragmentary material that the specimen might not be a small fruited form of *Cenchrus echinatus*."

The species has also been found in Cuba and in Bahamas on *C. echinatus*, by E. W. D. Holway.

39. PUCCINIA DEFORMATA Berk. & Curt. Jour. Linn. Soc. 10: 357. 1869.

Dicaeoma deformatum Kuntze, Rev. Gen. 3³: 468. 1898.

ON POACEAE:

Olyra latifolia L., San German, Dec. 12, 5849, 5855.

The type collection was made by Charles Wright in Cuba, 1856-7. A Porto Rican collection was made by A. A. Heller at Mayagüez, Jan. 30, 1890, 4443. Both are on *O. latifolia*.

40. PUCCINIA HUBERI P. Henn. Hedwigia Beibl. 39: 76. 1900.

ON POACEAE:

Panicum trichoides Sw., Villa Alba, Jan. 3, 82; Maricao, Jan. 10, 194; Nov. 18, 4810; Adjuntas, Nov. 22, 4973; Jayuya, Dec. 17, 5981; all show uredinia only.

The only other Porto Rican collection seen is one by G. P. Clinton on the same host, obtained at La Carmelita, April, 1904.

The species was established on a collection by Dr. J. Huber on *Panicum ovalifolium* obtained in the Botanical Garden of Para, Brazil. It has not yet come to light in North America outside of Porto Rico.

41. PUCCINIA LEVIS (Sacc. & Bizz.) Magn. Ber. Deut. Bot. Ges.
9: 190. 1891.

Diorchidium leve Sacc. & Bizz. *Michelia* 2: 648. 1882.

Puccinia Paspali Tracy & Earle, Bull. Torrey Club 22: 174.
1895.

Dicaeoma Paspali Arth. Result. Sci. Congr. Bot. Vienne 344.
1906.

ON POACEAE:

Paspalum plicatulum Michx., Vega Baja, Feb. 20, II, 490.

Ryttilix granularis (L.) Skeels (*Manisuris granularis* Sw.),
Rosario, Jan., 1914, 4835.

No other collections are known from Porto Rico, but it was found in Antigua on *P. fimbriatum*, by J. N. Rose 3410. Dr. P. Sydow kindly sent me material from his herbarium representing collections in *R. granularis* from Guadeloupe and Martinique.

A collection of the rust on *P. pilosum* Lam. was obtained by Dr. Stevens at Caracas, Venezuela. It is a rather common rust in South America, and extends into North America as far as Texas and Louisiana. The type of the species was from Brazil on *Manisuris granularis*. A careful comparative study of the North American rust on *Paspalum*, called *P. Paspali* by Tracy and Earle, shows the two forms to be identical.

42. PUCCINIA SUBSTRIATA Ellis & Barth. *Erythea* 5: 47. 1897.

Uredo Chaetochloae Arth. Bull. Torrey Club 33: 518. 1906.

Puccinia Chaetochloae Arth. Bull. Torrey Club 34: 585. 1907.

ON POACEAE:

Paspalum Helleri Nash, Vega Baja, May 21, 1732.

Paspalum orbiculatum Poir., Monte de Oro, Dec. 3, 5721.

Paspalum paniculatum L., Mayagüez, Jan. 30, 293; April
28, 898; Monte Alegrillo, Nov. 14, 4758.

The species was collected at Bayamon by E. W. D. Holway, Jan., 1911, on *P. Schreberianum* (Flügge) Nash, showing only uredinia.

Another West Indian collection was obtained by E. W. D. Holway in Cuba, March, 1903, on *Chaetochloa verticillata* (L.) Scribn. (*Setaria verticillata* Beauv.). A search in the phanero-

gamic herbarium at the N. Y. Bot. Garden revealed the following: from Cuba, on *C. imberbis* (Poir.) Scribn., J. A. Shafer 11795, A. E. Jennings 154, on *C. onurus* (Griseb.) S. & M., Norman Taylor 232, Britton & Wilson 29, on *C. setosa* (Sw.) Scribn., Rugel 880; from Jamaica on *C. purpurascens* (H.B.K.) S. & M., N. L. Britton 1659; and from Bermuda on *C. brevispica* S. & M., Stewardson Brown 116, 302.

43. PUCCINIA CANALICULATA (Schw.) Lagerh. Tromsö Mus. Aarsh. 17: 51. 1894.

Sphaeria canaliculata Schw. Trans. Am. Phil. Soc. II, 4: 209. 1832.

Puccinia Cyperi Arth. Bot. Gaz. 16: 266. 1891.

Uredo Kyllingiae P. Henn. Hedwigia 35: 256. 1896.

Dicaeoma canaliculatum Kuntze, Rev. Gen. 3^a: 466. 1898.

ON CYPERACEAE:

Cyperus laevigatus L., Guanica, Feb. 3, 349.

Cyperus radiatus Rottb., Mayagüez, Dec. 24, 1912, 147, May 3, 1160.

Cyperus sp., Villa Alba, Jan. 3, 114.

The species has also been collected in Porto Rico on *C. cayennensis* (Lam.) Britt., at Mayagüez, by G. P. Clinton, April, 1904; on *C. sphacelatus* Rottb., at Mayagüez and La Carmelita, both by G. P. Clinton, April, 1904; on *C. polystachus* Rottb., at Cataruo, by A. A. Heller, May, 1899; and on *C. surnamensis* Rottb., at Añasco, by A. A. Heller, Feb., 1900. It was also found on a phanerogamic specimen of *Kyllinga pumila* Michx. (*K. caespitosa* Nees), in the phanerogamic herbarium at the New York Botanical Garden, collected by J. A. Stevenson, at Rio Piedras, Feb., 1914, 1274, and on one collected by J. A. Shafer at Loma Icacó, July, 1914, 3452.

Collections have also been made in Jamaica by L. M. Underwood, on *C. mutisii* H.B.K., Feb., 1903, 1526, and by N. L. Britton, Sept., 1906, 14; and it was detected on a phanerogamic specimen of *Kyllinga pumila* from Martinique, collected by Père Duss, Aug., 1903, 4714.

44. PUCCINIA ELEOCHARIDIS Arth. Bull. Iowa State College 156.
1884.

Aecidium compositarum Eupatorii DeT.; Saccardo, Syll. Fung.
7: 798. 1888.

Dicaeoma Eleocharidis Kuntze, Rev. Gen. 3³: 468. 1898.

ON CYPERACEAE:

Eleocharis cellulosa Torr., Santurce, May 21, 1792.

Eleocharis geniculata (L.) R. Br., Mayagüez, March 9,
484, 489.

Eleocharis interstincta (Vahl) R. & S., Mayagüez, March
21, 416.

Eleocharis sp., Cataño, Nov. 3, 4530.

Porto Rican specimens of this rust have also been collected at Mayagüez, Feb., 1900, by A. A. Heller 4539, and April, 1904, by G. P. Clinton, and also at Rio Piedras, Feb., 1912, by J. R. Johnston 201. No other West Indian collections have been seen. All the collections cited show urediniospores only.

45. PUCCINIA FIMBRISTYLIDIS Arth. Bull. Torrey Club 33: 28.
1906.

ON CYPERACEAE:

Fimbristylis diphylla Vahl, Ponce, Nov. 8, 4381.

Fimbristylis ferruginea (L.) Vahl, Joyuda, March 31,
963; Santurce, May 21, 1874.

It has been collected on *Fimbristylis* sp., at Mayagüez, P. R., April, 1904, by G. P. Clinton, and on *F. diphylla*, at Asolen, Martinique, August 4, 1913, by Dr. F. L. Stevens 2970. No other West Indian collections have been seen. All the collections here mentioned show only uredinia.

46. **Puccinia scleriicola** sp. nov.

Uredinia amphigenous, scattered, oval or oblong, small, 0.3–0.6 mm. long, rather tardily naked, cinnamon-brown, somewhat pulverulent, ruptured epidermis conspicuous; urediniospores broadly ellipsoid or obovoid, 15–22 by 19–26 μ ; wall dark yellow, about 1.5 μ thick, finely and moderately echinulate, the pores 4, or sometimes 3, equatorial.

Telia chiefly hypophyllous, scattered, oval or oblong, small, 0.3–0.4 mm. long, tardily naked, blackish-brown; teliospores oblong or clavate-oblong, 15–19 by 29–42 μ , slightly constricted at the septum, truncate, oblique, or often rounded above, usually somewhat narrowed below; wall cinnamon-brown, 1.5–2 μ thick, usually thicker above, 3–6 μ , smooth; pedicel tinted, short.

ON CYPERACEAE:

Scleria sp., Preston's ranch near Naguabo, Dec. 31, II, 6684.

It also occurs on specimens in the phanerogamic collection of the New York Botanical Garden on *Scleria hirtella* Sw., collected at Markin Pena, P. R., June, 1913, II, by J. R. Johnston 843, and on *S. verticillata* Muhl., collected in Isle of Pines, Cuba, Dec., 1903, III, by A. H. Curtiss.

A number of localities are now known for the species in the United States. A collection was made on *S. hirtella*, at the edge of Long Prairie Hammock, on Camp Longview Trail, about forty miles southwest of Miami, Fla., Oct. 31, 1906, II and III, by Ernst A. Bessey. The following data have been secured from phanerogamic collections: in the Purdue University herbarium, on *S. Baldwinia* Torr., Everglades, Fla., June, 1877, II, A. P. Garber; N. Y. Bot. Garden herbarium, on *S. Baldwinia*, Everglades, Fla., March, 1892, II, J. H. Simpson 556, on *S. pauciflora* Michx., Sumter Co., Ga., July, 1901, II, Roland M. Harper 1036, on *S. setacea* Poir., Lee Co., Fla., July–August, 1900, II, A. S. Hitchcock 428, Braidentown, Fla., Nov. 15, 1900, II and III, S. M. Tracy, on *S. verticillata* Muhl., Everglades, between Cutler and Longview Camp, Fla., Nov. 9–12, 1903, II and III, J. K. Small and J. J. Carter. This last collection is taken as the type of the species.

This species has much darker colored and thicker-walled urediniospores than *Rostrupia Scleriae* Paz., or *Puccinia xanthopoda* Syd. It also differs in its urediniospores from *Uromyces Scleriae* P. Henn., the latter having spores strongly thickened above.

47. PUCCINIA CANNAE (Wint.) P. Henn. Hedwigia

41: 105. 1902.

Uredo Cannae Wint. Hedwigia 23: 172. 1884.

Puccinia Thaliae Dietel, Hedwigia 38: 250. 1899.

ON CANNACEAE:

Canna coccinea Ait. (*C. portoricensis* Bouché), Mamayes, May 21, 1912, II, 9.

Canna glauca L., Cabo Rojo, Oct. 24, 1912, II, III, 169c, Oct. 30, 1912, II, 169.

Canna sp., Rio Piedras, June 2, 1912, II, 16; Santurce, Jan. 3, 1912, II, 33; Corozal, Feb. 21, II, 405; Mayagüez, April, 1912, II, III, 4c, April 30, II, 983; Añasco, Oct. 19, 3595, II, 3603; Rosario, Nov. 14, II, 4834; without locality or date, II, 157.

ON MARANTACEAE:

Thalia geniculata L., Añasco, July 28, 1912, II, 66; Mayagüez, July 29, 1912, II and III, 66c.

The rust has also been collected on one of the two species of wild *Canna* known in Porto Rico by G. P. Clinton at Mayagüez, April 11, 1904, and on cultivated *Canna* at San Juan, April 8, 1904, and by J. A. Stevenson on Trujillo Alto road Nov., 1914, 2338. It was also gathered on cultivated *Canna* at San Juan, by E. W. D. Holway, Jan., 1911. It was collected at Mayagüez, April, 1904, by G. P. Clinton on *Thalia geniculata*.

From other islands specimens have been seen collected by F. S. Earle in Jamaica on cultivated *Canna*, Oct.-Nov., 1902, 56, and by both Mel. T. Cook, July 10, 1906, and C. F. Baker, July 2, 1906, in Cuba, on *Canna indica*. The last collection is issued in Sydow, Uredineen 2114, and Bartholomew, Fungi Columbiani 2387.

As usual with tropical rusts, the telia of this species are not abundantly produced. In the Stevens' set only four of the fourteen collections show telia. The telia, however, are in normal development. The collections of April and October, 1912, on *Canna*, were sent to Lafayette with the hope that they might be used in cultural work, but the teliospores could not be brought to germination, although every condition seemed favorable.

In comparing the collections on *Canna* and *Thalia*, there being two of each with both uredinia and telia, no difference could be found in the microscopic appearance of the fungus on the two hosts. The two hosts have essentially the same texture and structure of leaf. In both there is an epidermal layer of small,

rectangular cells, augmented by a hypodermal layer of very large, rectangular cells, the cells in both instances having uniformly thin, but firm walls. The sori are situated below the hypodermal layer, often directly beneath a stoma. The resistance of the overlying tissue evidently accounts for the angular and irregular spores of both uredinia and telia.

The habitat for both *Canna* and *Thalia* is the same, and their manner of growth is similar. The two genera belong to closely related families, with many important characters in common. There are now many species of rusts known to go to more than one family of hosts. There seems no longer any good reason, either in the nature of the fungus or in the matter of convenience, for maintaining two specific names, and they are herewith united.

48. PUCCINIA MACROPODA Speg. An. Soc. Ci. Arg. 10: 8. 1880.

Uredo striolata Speg. An. Soc. Ci. Arg. 9: 173. 1880.

ON AMARANTACEAE:

Iresine elatior L. C. Rich., Desecheo, May 31, II, 1613.

The same rust in its characteristic uredinial stage was collected on the same host on the island of St. Thomas, May, 1906, by C. Raunkiaer, and on *Iresine paniculata* (L.) Kuntze in Cuba, March, 1903, by E. W. D. Holway.

49. PUCCINIA RIVINAE (Berk. & Curt.) Speg. An. Mus.

Buenos Aires 19: 304. 1909.

Aecidium Rivinae Berk. & Curt. Jour. Linn. Soc. 10: 358. 1869.

Endophyllum Rivinae Arth. N. Am. Flora 7: 126. 1907.

Puccinia Raunkiaerii Ferd. & Winge, Bot. Tidsskr. 29: 8. 1908.

ON PETIVERIACEAE (PHYTOLACCACEAE):

Rivina humilis L., Desecheo, May 31, I, II, 1590.

Collections on the same host have been seen from Cuba, June, 1906, I, Mel. T. Cook, and from St. Thomas, Oct., 1906, I, II, III, C. Raunkiaer 1819, also on *R. octandra* L. from Cuba, April, 1905, I, Baker & Van Herman 4775.

50. PUCCINIA INFLATA Arth. Bull. Torrey Club 33: 516. 1906.

ON MALPIGHIACEAE:

Stigmaphyllon lingulatum (Poir.) Small (*Triopteris lingulata* Poir.), Desecheo, Jan. 2, O, II, III, 131, May 31, O, II, III, 1578, 1600; Boqueron, Feb. 15, II, 328bis; Guanica, Feb. 3, II, 334; Coamo Springs, April 6, III, 818, 850; Mona Island, Dec. 20, 21, III, 6105.

This species was collected in Porto Rico on the same host by E. W. D. Holway, at Ponce, Jan., 1911.

It has been collected in Cuba on *S. periplocifolium* (Desf.) Juss. by Mr. Holway, March, 1903 (Barth. N. Am. Ured. 42), and by C. F. Baker, Oct., 1904, 3538, and on *S. Sagraeanum* A. Juss. by Britton, Earle & Wilson, April, 1910, 6269.

51. PUCCINIA EUPHORBIAE P. Henn. Engler's Bot. Jahrb.

17: 13. 1893.

ON EUPHORBIAEAE:

Aklema petiolaris (Sims) Millsp. (*Euphorbia petiolaris* Sims), Mona Island, Dec. 20, 21, 6185.

The only other West Indian specimen of this species seen by the writer was collected on the same host in St. Thomas, March, 1913, by J. N. Rose 4510.

52. PUCCINIA ARECHAVELATAE Speg. An. Soc. Ci. Arg.

12: 67. 1881.

ON SAPINDACEAE:

Cardiospermum microspermum H.B.K., Quebradillas, May 21, 1124; Desecheo, May 31, 1628, without locality or date, 1261.

This common tropical rust was also collected on the same host by E. W. D. Holway at San Juan, Porto Rico, Jan., 1911. It was also collected on same host by A. S. Hitchcock (labeled *C. Halicacabum*), in Jamaica, Jan., 1891, and on phanerogamic specimens now in the N. Y. Bot. Garden herbarium, by J. A. Shafer 183 in Cuba, by Percy Wilson 8409 in Bahamas, and by Rose, Fitch & Russell 3333 in Antigua. The species was also collected on *C. grandiflorum* Sw. in Jamaica by L. M. Underwood, Sept., 1906.

53. PUCCINIA GOUANIAE Holw. Ann. Myc. 3: 21. 1905.

ON FRANGULACEAE (RHAMNACEAE):

Gouania lupuloides (L.) Urban (*G. domingensis* L.),
Rosario, Feb. 16, II, iii, 322a; Yauco, Oct. 3, II, 3134;
Cabo Rojo, Dec. 27, II, 6471.

Gouania polygama (Jacq.) Urban (*G. tomentosa* Jacq.),
Mayagüez, Feb. 3, II, iii, "x," May 4, II, 1209, 1481,
May 24, II, 1705; Rosario, Oct. 27, II, 3774; Lares,
Nov. 22, II, 4848; Aguadilla, Nov. 25, II, 4857; San
German, Dec. 12, II, iii, 5860.

The species has also been collected in Porto Rico by E. W. D. Holway at Mayagüez, Jan., 1911, on *G. lupuloides*.

The type collection was made at Gebara, Cuba, by Mr. Holway, March 1903, on *G. polygama* (Barth. N. Am. Ured. 544). A collection made in Cuba by Charles Wright in 1856-7, represented in the Curtis Herbarium at Harvard University under the name "*Uredo gemmata* Berk & Curt.," belongs here. The host of this collection has recently been determined at the N. Y. Bot. Garden as *G. polygama*. Only uredinia are shown on it. I can not find that the name has been published. It is quite distinct from the collection in the same herbarium labeled "*Uredo gemmata* B. & C. var.," which belongs to *Uromyces gemmatus* Berk. & Curt. on *Jacquemontia nodiflora*. The rust occurs on a phanerogamic collection of *G. polygama* in the N. Y. Bot. Garden, collected at Herradura, Cuba, March 1907, by F. S. Earle 806.

The only other collection of this rust known to the writer from the West Indies or elsewhere is one made on *G. lupuloides* in Panama, Oct., 1899, by G. von Lagerheim, showing both uredinia and telia. The packet is marked "rarissime!"

The urediniospores in collections "x" and 4857 appear to have three pores that are superequatorial. However, it is difficult to decide with certainty regarding the position of pores in but a small percentage of the spores of a mount, and it is impossible to say that this character is really distinctive. There appear to be no other characters, except possibly that the teliospores of "x" are somewhat larger than in 322a and 5860, which would separate these collections morphologically. The pore condition may eventually prove to be a variable character or possibly a racial character.

Puccinia gouaniicola Speg., on *Gouania latifolia* from Argentina, has teliospores of somewhat similar shape and size but with clear golden-yellow walls, and fragile pedicels. The sori are large and cushion-shaped, and unaccompanied by urediniospores. The species appears to be a leptopuccinia, and not yet represented in North America. I am indebted to Dr. Spegazzini for a portion of the type collection of *P. gouaniicola*.

54. PUCCINIA HETEROSPORA Berk. & Curt. Jour. Linn. Soc.
10: 356. 1869.

Uromyces pulcherrimus Berk. & Curt. Grevillea 3: 56. 1874.

Uromyces Thwaitesii Berk. & Br. Jour. Linn. Soc. 14: 130.
1875.

Uromyces Sidae Thüm. Rev. Mycol. 1: 10. 1879.

Uromyces pictus Thüm. Rev. Mycol. 1: 10. 1879.

Uromyces malvacearum Speg. An. Soc. Ci. Arg. 12: 71. 1881.

Puccinia Thwaitesii Winter, Hedwigia 22: 130. 1883.

Uromyces malvicola Speg. An. Soc. Ci. Arg. 17: 94. 1884.

Dicaeoma pulcherrimum Kuntze, Rev. Gen. 3³: 467. 1898.

ON MALVACEAE:

Abutilon hirtum (Lam.) Sweet., Guanica, Feb. 3, 330,
Feb. 10, 343.

Sida glutinosa Comm. (*S. nervosa* DC.), Villa Alba, Jan.
3, 106.

Sida humilis Cav., Boqueron, Feb. 15, 330bis.

Sida procumbens Sw., Guanica, Feb. 3, 322; Desecheo.
May 31, 1583.

Sida spinosa L., Guayama, Dec. 4, 5331.

Sida urens L., Guayamilla, Nov. 13, 5870; Coama Springs,
Jan. 1, 59; Vega Baja, Feb. 22, 383; Yauco, Oct. 3,
3133, 3249; Maricao, Oct. 8, 3449; Rosario, Oct. 27,
3790, 3835, Nov. 14, 4846; Vega Alto, Nov. 19, 4145;
Ponce, Nov. 8, 4274; Mayagüez, Nov. 13, 4716a, Jan.
14, 1914, 6784; Aguada, Nov. 22, 5108; El Gigante near
Adjuntas, Dec. 15, 5821.

Wissadula periplocifolia (L.) Presl (*Abutilon periploci-*
folium G. Don), Coama Springs, Jan. 1, 271; Guanica,
Feb. 3, 329.

The species was also collected at Ponce, on *Sida* sp., by E. W. D. Holway, Jan., 1911; at Vieques Island on *Sida humilis*, by J. A. Shafer, Jan., 1914, 2504A; and at Rio Piedras on *Sida urens*, by J. A. Stevenson 2453. It also occurs on a phanerogamic specimen of *Wissadula periplocifolia* in the herbarium of the N. Y. Bot. Garden, collected at Yauco by Underwood & Griggs 625, June-July, 1901.

The species, which is very common in warmer regions, is also represented in the writer's herbarium from Bahamas, Cuba, Jamaica, St. Croix, and St. Thomas.

55. PUCCINIA PSIDII Wint. Hedwigia 23: 177. 1884.

Uredo flavidula Wint. Hedwigia 24: 260. 1885.

Uredo Myrtacearum Paz. Hedwigia 29: 159. 1890.

Uredo Eugeniarum P. Henn. Hedwigia 34: 337. 1895.

Puccinia Jambosae P. Henn. Hedwigia 41: 105. 1902.

ON MYRTACEAE:

Jambos Jambos (L.) Lyons (*Eugenia Jambos* L.), Con-sumo, April 27, II, 886, Oct. 23, 1912, II and III, 63c; Maricao, without date, II, 159, Oct. 12, II and III, 182; April 2, II, 429, April 3, II and III, 710, II, 720; Rio Maricao above Maricao, Sept. 30, II, 3626, Sept. 20, II and III, 3652; Barros, Jan. 2, II and III, 208; Villa Alba, Jan. 3, II and III, 528; Monte de Oro near Cayey, Dec. 3, II, 5719; Lajome Alto, Dec. 3, II, 5759; El Gigante near Adjuntas, Dec. 15, 6017.

Psidium Guajava L., Villa Alba, Jan. 3, II, 108.

The rust has also been collected at the base of El Yunque, Cuba, March, 1903, by E. W. D. Holway and by Underwood & Earle. No other North American collections are known to the writer.

The ample collections secured by Dr. Stevens have made it possible to get so good an understanding of the species and its hosts, that the synonymy can now be adjusted. Urediniospores of the five species, as named above, have been examined, and found to agree perfectly. Type material of *Uredo flavidula*, as

distributed in Rab.-Winter, Fungi Europaei 3312, has been studied as well as type material of *Uredo Eugeniarum*. Authenticated material of *Uredo Myrtacearum*, distributed in Sydow, Uredineen 2100, and of *Puccinia Jambosae*, have also been examined. They appear to be identical in their urediniospores, and the teliospores of the last mentioned agree exactly with those in the Stevens' collections on the same host. The original descriptions, establishing the five names above, agree in all essentials where they touch upon the same characters. There are no known species of *Uromyces* on hosts belonging to the *Myrtaceae*, and therefore a possible complication is removed.

In Sydow's Monog. Ured. 1: 437, Spegazzini's species *Uredo subneurophyla* (Anal. Soc. Ci. Agr. 17: 123. 1884), which is on a species of *Psidium* from Paraguay, is listed as a synonym of *Puccinia Psidii*. I have studied a part of the type collection of *U. subneurophyla* and find that it does not agree with this species, and in fact does not belong to the *Uredinales*, being a fungus quite unlike a rust. I have seen no material of Spegazzini's *Uredo neurophyla*, published on the preceding page of the same work. This species is said to be on leaves of *Myrtaceae*, and to greatly differ from his *U. subneurophyla*. So far as one can judge from the most inadequate description, it may well be a synonym of *P. Psidii*.

Two other species of rusts are recorded as inhabiting Myrtaceous hosts. *Puccinia sanguinolenta* P. Henn., said to be on *Myrcia*, is really on the Malpighiaceae host, *Heteropteryx*, as pointed out by Holway, N. Am. Ured. 1: 59. 1907. Material of *Puccinia Rompelii* Magn., said to be on *Myrtaceae*, proves to be a distinctive species, quite unlike the above.

56. ***Puccinia conrescens* Ellis & Everhart sp. nov.**

Puccinia compacta Kunze; Bubák, Hedwigia Beibl. 42: 30. 1903. Not Berk. 1855, DeBary 1858, or Thüm. 1875.

ON ASCLEPIADACEAE:

Asclepias curassavica L., Vega Baja, Feb. 20, 485, March, 517; Aibonito, June 5, 2139; Manati, Nov. 25, 5310, 5311; Jajome Alto, Dec. 3, 5645.

The species was also collected in Porto Rico on the same host by Mr. and Mrs. A. A. Heller in 1899, 863, as noted below, and by E. W. D. Holway, above Comercio, Feb., 1911.

It was also found in the phanerogamic collection at the New York Botanical Garden on the same host collected by A. H. Curtiss near Nassau, Bahamas, Dec., 1902, 2, by Britton & Millspaugh at Eight Mile Rocks, Great Bahama, Feb., 1905, 2428, and by Pollard & Palmer at Baracoa, Cuba, Jan., 1902, 11.

It was pointed out by Bubák in 1901 (Sitz, Böhm. Ges. Wiss., page 5 of separate) that the earliest use of the name, *Puccinia compacta*, was for some species quite unlike the Ranunculaceous rust, for which DeBary's name had then come into use. It appears that Kunze gave the name to a collection from Surinam, made by Weigelt in 1827. Thümen remarks in Flora (1875, p. 364) that "the fungus from Surinam is highly characteristic, and I here give a diagnosis drawn from an original specimen, as none is known to me." Thümen's diagnosis and appended comments show that the specimen he had in hand was one collected in Surinam by Weigelt on an undetermined host, which we now know to be *Dasyscypha foveolata* Berk. & Curt. on *Xylopia* sp. This was the same collection that Kunze had intended to name *Puccinia gregaria*. Hennings tells us in Hedwigia (1896, p. 230) that he found a specimen in the Berlin herbarium collected by Weigelt in Surinam, 1827, bearing the name *P. gregaria* Kunze and with a Latin diagnosis appended, which he publishes. The herbarium name of *P. compacta*, given by Kunze to a collection by Weigelt in Surinam on some Asclepiadaceous plant (now known to be *Asclepias curassavica*), was first published by Bubák in 1903, accompanied with a description and figures.

In the Ellis herbarium, now at the New York Botanical Garden, is a specimen of rust from Porto Rico, inscribed *Puccinia con-crescens* E. & E., accompanied by a diagnosis in Mr. Ellis' handwriting. This name, as I have previously stated (Jour. Myc. 11: 10: 1905), appears not to have been published. In the absence of a usable name, the one given by Ellis may be brought forward, and it is here presented with Ellis' description slightly modified.

Telia hypophyllous, in orbicular groups on discolored spots, pulvinate, crowded but distinct, becoming confluent at the center into a cushion-like mass 2-4 mm. across, chestnut-brown, often darker at the center of the groups and paler at the edges; teliospores oblong-elliptical; often irregular, 12-20 by 20-40 μ , rounded or obtuse at both ends, or oftener somewhat narrowed below, slightly or not constricted at septum, which is occasionally oblique; wall chestnut-brown or paler, smooth, uniformly thick, 1.5-2 μ , or slightly thicker above in some spores; pedicel as long or longer than the spore, but usually appearing short by being broken away.—On *Asclepias curassavica* L., Aibonito, Porto Rico, March 22, 1899. Mr. & Mrs. A. A. Heller 863, host no. 862.

A part of this type collection was sent to Dr. Bubák in 1903, and was pronounced by him to be identical with the Weigelt collection from Surinam. He sent in return a portion of the Weigelt collection obtained from the botanical division of the Bohemian Museum in Prag, which fully substantiated his statement.

57. PUCCINA OBLIQUA Berk. & Curt. Jour. Linn. Soc.

10: 356. 1858.

Puccinia Cynanchi Lagerh. Bol. Soc. Brot. 7: 129. 1889.

Puccinia sphaerospora Syd. & Henn. Ann. Myc. 1: 327. 1903.

ON ASCLEPIADACEAE:

Metastelma lineare Bello, Barros, Jan. 2, 132.

Metastelma parviflorum R. Br., Vega Baja, Feb. 22, 368;

Quebradillas, Nov. 22, 5023.

Other West Indian collections have been made on *M. parviflorum* in St. Thomas, March, 1913, by J. N. Rose 4509, and on *M. SchlechtendahlII* DC. in St. Croix, Dec., 1895, by A. E. Ricksecker, and in St. Thomas, March, 1913, by J. N. Rose. The type collection for the name *P. Cynanchi* Lag. is recorded for Martinique on *M. parviflorum*, but has not been examined. The species also occurs on phanerogamic specimens in the N. Y. Bot. Garden on *Fischeria crispiflora* (Sw.) Schl. from Isle of Pines, Cuba, May, 1910, O. E. Jennings 439, and from Jamaica, Feb., 1906, A. E. Wight 150.

Through the kindness of the Director of the Kew Herbarium I have been enabled to examine a part of the type material of

Puccinia obliqua Berk. & Curt., collected in Cuba, by Charles Wright. The material consists of a complete leaf, the blade of which is ovate, four by eight millimeters, entire and smooth, with a petiole five millimeters long. The under surface of blade and petiole is quite evenly covered with about eighty pulvinate, prominent, brown sori. Both gross and microscopic appearance of the fungus that has of recent years been assigned to *Puccinia sphærospora* S. & H. agree with this specimen. The host is undoubtedly some Asclepiadaceous plant, probably a *Vincetoxicum* or *Philibertia*.

The closely related species, *Puccinia Gonolobi* Rav., has been collected in the Bahamas on *Metastelma palustre* (Pursh) Schl., Aug., 1904, E. G. Britton 396, Jan., 1903, and March, 1905, A. E. Wight, on *Philibertia clausa* (Jacq.) Vail, Feb., 1905, E. G. Britton 3423, and in Cuba on the last host, March, 1910, Britton, Earle & Wilson 6022.

58. PUCCINIA CRASSIPES Berk. & Curt. *Grevillea* 3: 54. 1874.

Puccinia Ipomoeae Cooke; Lagerh. Tromsö Mus. Aarsh. 17: 61. 1895.

ON CONVULVULACEAE:

Ipomoea triloba L., Mona Island, Dec. 20, 21, 6086, 6236, 6239.

The collections show both aecia and telia in good condition, as also does a collection from Santa Ysabel, P. R., J. R. Johnston 203, Jan., 1912.

Collections have been seen also from St. Croix, on *I. triloba*, and from Cuba, on *I. acuminata* (Vahl) R. & S. (*I. cathartica* Poir.) by Earle & Wilson 1140 (Barth. Fungi Columb. 2456), and on *I. trichocarpa* Ell. (*I. carolina* Pursh not L.) by Britton, Earle & Wilson 4827.

59. PUCCINIA LANTANAE Farl. Proc. Amer. Acad. Sci.
18: 83. 1883.

ON VERBENACEAE:

Lantana Camara L., Guanica, Feb. 3, 358, Dec. 29, 6607; Lares, Nov. 22, 4926; Guayanilla, Nov. 13, 5952, Dec. 29, 6603.

Lantana involucrata L. (*L. odorata* L.), Boqueron, Feb. 15, 354; Arecibo, May 21, 1781; Quebradillas, Nov. 22, 5017; San German, Dec. 8, 5763; Mona Island, Dec. 20, 21, 6440; without locality, Jan. 17, 1914, 6823.

This species has not before been seen by the writer from Porto Rico. It has often been collected in other West Indian islands, however. In Cuba it was found on *L. Camara*, March, 1903, E. W. D. Holway (Barth, N. Am. Ured. 645), Sept., 1906, L. M. Underwood 3248; on *L. involucrata*, May, 1906, C. F. Baker 2869, and on a phanerogamic specimen in the N. Y. Bot. Garden on *L. trifolia* L., April, 1902, S. H. Hamilton 46. In Jamaica it was found on *L. crocea* Jacq., Sept., 1906, N. L. Britton 35, and on a phanerogamic specimen in the N. Y. Bot. Garden on *L. stricta* Sw., Sept., 1906, N. L. Britton 7. In the Bermudas it was collected on *L. involucrata*, Nov.-Dec., 1912, Brown, Britton & Seaver 1301, and in St. Thomas on *L. aculeata* L., March, 1913, J. N. Rose.

60. PUCCINIA URBANIANA P. Henn. Hedwigia 37:278. 1898.

ON VERBENACEAE:

Valerianodes jamaicensis (L.) Medic. (*Abena jamaicensis* Hitchc., *Stachytarpheta jamaicensis* Vahl), Santurce, June 12, 1912, 64, Jan. 16, 241; Vega Baja, Nov. 5, 4232; Manati, Nov. 25, 4900, 5280; Guayama, Oct. 4, 5554; River junction below Utuado, Dec. 16, 6038.

Valerianodes strigosa (Vahl) Kuntze (*Stachytarpheta strigosa* Vahl), Cabo Rojo, June 15, 2285; Mona Island, Dec. 20, 21, 6252, 6279.

Porto Rican collections on *V. jamaicensis* have also been made at San Juan, May, 1903, F. S. Earle, and Feb., 1911, E. W. D. Holway; at Mayagüez, April, 1904, G. P. Clinton; and at Rio Piedras, Feb., 1913, J. R. Johnston 946.

Other West Indian collections have been made in Cuba, March, 1906, by C. F. Baker 830, in Jamaica, Oct.-Nov., 1902, by F. S. Earle 204, Jan., 1903, by L. M. Underwood, Feb., 1913, by E. W. D. Holway 216, and in the Bahamas, Nov., 1890, by A. S. Hitchcock, and March, 1903, by E. W. D. Holway (Barth. N. Am. Ured. 669).

61. **Puccinia Leonotidis** (P. Henn.) comb. nov.

Uredo Leonotidis P. Henn. in Engler, Pfl. Ost.-Afr. C: 52.
June, 1895.

Aecidium Leonotidis P. Henn. in Engler, Pfl. Ost.-Afr. C: 52.
June, 1895.

Uredo cancerina P. Henn. Hedwigia 34: 330. December, 1895.

Uredo leonoticola P. Henn. Hedwigia 38: 69. 1899.

Puccinia leonotidicola P. Henn. in Baum, Kun.-Samb. Exp.
1903.

ON LAMIACEAE (LABIATAE):

Leonotis nepetaefolia (L.) R. Br., Yabucoa, May 17, 1912,
4; Coamo Springs, Jan. 1, 127, April 6, 845; Hormi-
gueros, Jan. 14, 216; Bayamon, Feb. 14, 390; Lares,
Nov. 22, 4836, 4916; Guayama, Dec. 4, 5336; Ponce,
Dec. 4, 5394; Guayanilla, Nov. 13, 5869.

The West Indian collections examined are from Ponce, P. R.,
Jan., 1911, E. W. D. Holway; Rio Piedras, P. R., 1912, J. R. Johns-
ton, 454, 498, between Aibonito and Cayey, P. R., Feb., 1899, A. A.
Heller 557; Kingston, Jamaica, Oct., 1899, G. Lagerheim, and
July, 1910, Eug. Mayor 119; Port Antonio, Jamaica, Feb., 1915,
E. W. D. Holway; Havana, Cuba, March, 1903, E. W. D. Hol-
way (Barth. N. Am. Ured. 781); Nassau, Bahamas, June, 1909,
P. Wilson 8437.

So far no American collection has revealed other than uredi-
niospores. These are characteristic in being somewhat flattened
from above, with the wall slightly thicker in the upper part, and
in having three to five, usually four, basal pores close to the hilum.
A collection by Lagerheim from Jamaica bears the inscription
"*Uredo basipora* Lagerh. n. sp.," which indicates that the peculiar
arrangement of pores was seen by Lagerheim, but I do not find
that he published his proposed name.

The assignment of the species to the genus *Puccinia*, is based
upon observations by Hennings, who published a description of
teliospores, taken from South African material. In my her-
barium is a part of the same collection, made April 18, 1900, by
the Kunene-Zambesi Expedition, one half of a well rusted leaf,
but it shows no teliospores, although there is an abundance of

characteristic urediniospores. A portion of the type material of *Uredo cancerina* and *U. leonoticola* has been examined. The species as here indicated seems consistent with other species on related hosts in its morphology, and with tropical forms generally in rarely producing other than repeating spores.

62. PUCCINIA MEDELLINENSIS Mayor, Mem. Soc. Neuch. Sci.
5:497. 1913.

Aecidium Hyptidis P. Henn. Hedwigia 34:337. 1895.

Eriosporangium tucumanense Arth. (in part) N. Am. Flora.
7:212. 1912.

ON LAMIACEAE (LABIATAE):

Mesosphaerum atrorubens (Poir.) Kuntze (*Hyptis atrorubens* Poir.), Santurce, Jan. 22, 255.

Mesosphaerum pectinatum (Poir.) Kuntze (*Hyptis pectinata* Poir.) Villa Alba, Jan. 3, III, 49; Coamo Springs, Jan. 1, I, 152; Corozal, Feb. 21, II, 413; Mayagüez, April 30, II, 938, May 1, II, 1065; Rosario, Oct. 27, II, 3834; Lares, Nov. 22, I, II, II, 4921; Cabo Rojo, Dec. 27, II, 6486.

Mesosphaerum suaveolens (L.) Kuntze (*Hyptis suaveolens* Poir.), Mayagüez, April 15, 882, Oct. 31, 3892; Ponce, Nov. 11, 4275; Aguada, Nov. 22, 4913; Guayama, Dec. 4, 5397; Guayanilla, Nov. 13, 5867.

Other West Indian collections of this species on *M. pectinatum* are from La Carmelita, P. R., April, 1904, O, I, II, III, G. P. Clinton, 128, Aibonito, P. R., Feb. 1911, II, III, E. W. D. Holway, Mandeville and Kingston, Jamaica, Feb., 1915, E. W. D. Holway, 224, 232.

Collections of urediniospores on *M. suaveolens* have also been made at Constance Springs, Jamaica, Dec., 1910, by A. S. Hitchcock, and at Santiago, Cuba, March, 1903, by E. W. D. Holway.

The form on *M. pectinatum* reported in the North American Flora was confused with the South American form on *M. spicatum*, which until the present time has only been described under the name of *Aecidium tucumanense* Speg. Type material of the latter, however, shows uredinia and telia sparingly among the aecia. The spore-forms are all somewhat larger than those of

the form on *M. pectinatum*, the teliospores measuring about the same length, but half as much wider. The South American species should be called ***Puccinia tucumanensis*** (Speg.) comb. nov.

Type material of *P. medellinensis* agrees perfectly with the Stevens' collections on *M. pectinatum*, and also with the collections cited in the North American Flora on page 213 of volume 7. Type material of *Aecid. Hyptidis* P. Henn. also agrees with this species in morphological characters, and the host appears to be *M. pectinatum*, as well as one can tell from a few leaves.

All collections so far seen on *M. atrorubens* and *M. suaveolens* show only urediniospores. The teliospores of *P. Hyptidis* and *P. medellinensis*, as well as *P. tucumanensis* are readily told apart, but the urediniospores of these species all have two equatorial pores, and otherwise are too much alike to be distinguished with certainty when taken by themselves. So far as any differences exist, and especially in the large proportion of urediniospores with the vertical axis shorter than the transverse axis, they indicate that the forms can best be placed here.

63. PUCCINIA HYPTIDIS (M. A. Curt.) Tracy & Earle, Bull. Miss. Exp. Sta. 34:86. 1895.

Eriosporangium Hyptidis (Curt.) Arth. N. Am. Flora 7:211. 1912.

ON LAMIACEAE (LABIATAE):

Mesosphaerum capitatum (L.) Kuntze (*Hyptis capitata* Jacq.), Mayagüez, Jan. 7, 57, Jan. 30, 305, Jan. 28, 374; Villa Alba, Jan. 3, 105, 136, 149; Coamo Springs, Jan. 1, 100; Vega Baja, Feb. 20, 471; Añasco, Oct. 12, 3526; Rosario, Oct. 27, 3826, Nov. 14, 4841; Quebradillas, Nov. 22, 5166; Monte de Oro near Cayey, Dec. 13, 5707; Lares, Nov. 22, 5932; El Gigante near Adjuntas, Dec. 15, 6023.

The above numbers show only uredinia, and the assignment to *Puccinia Hyptidis* is somewhat uncertain. The size of the urediniospores, thickness of wall, echinulation, pore-arrangement, and the rarity of flattened spores in which the vertical diameter is less than the transverse, are all characters that agree with those of

the urediniospores of *P. Hyptidis*. Until teliospores are discovered, the form is most conveniently left here.

Collections of uredinia on the same host have also been made in Porto Rico at Bayamon, Jan., 1911, in Cuba at Baracoa, March, 1903, and in Jamaica at Port Antonio, Feb., 1915, all by E. W. D. Holway.

64. ***Puccinia insititia*** sp. nov.

ON LAMIACEAE (LABIATAE):

Mesosphaerum latanifolium (Poir.) Kuntze (*Hyptis latanifolia* Poir.), Aibonito, June 5, 2133.

A small amount of material was found, showing urediniospores only. These spores are quite unlike other American rusts on this genus of hosts so far seen by the writer, especially in having three equatorial pores. The specimen seems identical, so far as it goes, with a collection on the same host from Manos in the Amazon region of Brazil, collected by E. Ule in 1901, and distributed under the name of *Aecidium Hyptidis* P. Henn. The Brazilian material shows urediniospores and a few teliospores. Many of the uredinia simulate aecia in gross appearance by the ruptured epidermis becoming white like a peridium, and somewhat in the microscopic appearance by the fine, close sculpturing of the spores. There are no aecia present on the specimen in hand, and probably the name was given from the aecia-like uredinia. On the strength of this Brazilian collection, which is made the type as it is represented in the herbarium of the New York Botanical Garden, the form is here established as a species under the above name, with the following description:

Uredinia hypophyllous, scattered, round, 0.3–0.6 mm. across, rather early naked, encircling epidermis evident, often white and peridioid, urediniospores globoid or broadly ellipsoid, 20–25 by 23–28 μ ; wall cinnamon-brown, thin, 1–1.5 μ , densely and finely echinulate-verrucose, the pores 3, equatorial, often indistinct.

Teliospores narrowly ellipsoid, 16–24 by 48–55 μ , rounded or obtuse above, rounded or narrowed below, slightly or not constricted at septum; wall colorless, thin, 1 μ or less, smooth; pedicel colorless, delicate, about half length of spore.

65. PUCCINIA SALVIICOLA Diet. & Holw. Bot. Gaz. 24:33. 1897.

ON LAMIACEAE (LABIATAE):

Salvia occidentalis Sw., Mayagüez, Jan. 15, 285, April 17, 526; Corozal, Feb. 21, 407; Aguada, Nov. 22, 5088.

The rust has also been found on the same host in Porto Rico at Caguas, 1899, Mr. & Mrs. A. A. Heller 941, at La Carmelita, April, 1904, G. P. Clinton, and at Ponce, Feb., 1911, E. W. D. Holway. All Porto Rican specimens so far seen show only uredinia. There is a close resemblance between the uredinia of this species and those of *Puccinia medellinensis*, but the teliospores are very unlike. A collection on the same host, made in Jamaica on Mt. Diabolo, 2000 feet altitude, April, 1903, by L. M. Underwood 1802, shows a few telia on the stems, well supplied with characteristic teliospores, and with uredinia on the leaves, which clearly establishes the species for this host in the West Indies. It was collected, showing uredinia only, at Port Antonio, Jamaica, Feb., 1915, by E. W. D. Holway 220, on the same host.

66. PUCCINIA BLECHI Lagerh. Bull. Soc. Myc. Fr. 11:214. 1895.

Uredo balaensis Syd. Ann. Myc. 1:21. 1903.

ON ACANTHACEAE:

Blechum Brownei (Sw.) Juss., Mayagüez, April 16, 525.

The two names cited above appear to belong to the same rust as the one collected by Stevens in Porto Rico, although type material has not been examined. The rust on the same host has also been found in Guatemala, Jan., 1906, W. A. Kellerman 5400.

67. PUCCINIA LATERITIA Berk. & Curt. Jour. Phila. Acad. Sci. 2:281. 1853.

ON RUBIACEAE:

Borreria levis (Lam.) Griseb., Vega Baja, Feb. 20, 474; Cabo Rojo, Sept. 28, 3187; Coamo Springs, Jan. 1, 141; San Sebastian, Nov. 22, 5186.

Borreria verticillata (L.) G. F. W. Mey., without locality, June 12, 1912, 31; Mayagüez, July 12, 1912, 45, Jan. 12, 21, Jan. 15, 288; Boqueron, Feb. 15, 347; Bayamon, May 21, 1886; Indura Fria, Maricao, Oct. 8, 3461;

- Cataño, Nov. 6, 4191; Utuado, Nov. 8, 4416, 4581a;
 Lares, Nov. 22, 4846bis; Quebradillas, Nov. 22, 5014;
 Aguada, Nov. 22, 5103.
Diodia maritima Thonn., Mayagüez, Feb. 8, 284a, 289.
Diodia rigida C. & S., Manati, May 11, 4243a; Rio Piedras,
 Nov., 5727.
Ernodea littoralis Sw., Boqueron, Feb. 15, 348; Mona
 Island, Dec. 20, 21, 606F, 6058.
Mitracarpus portoricensis Urban, Guanica, Dec. 29, 6827.
Spermacoce tenuior (L.) Lam., Hormigueros, Jan. 14, 213,
 713; Guanica, Feb. 3, 323; Coamo Springs, April 6,
 846; Cabo Rojo, June 15, 2266; San German, Nov. 8,
 5813, 5816.

This common, short cyle rust of warm regions has also been found in Porto Rico on *B. laevis* at Mayagüez, April, 1904, G. P. Clinton, and at Rio Piedras, June, 1912, J. R. Johnston 457, on *B. verticillata*, between Caguas and Cayey, June, July, 1901, Underwood & Griggs 295a, at Rio Piedras, June, 1914, J. A. Stevenson 2013, on *D. maritima*, at Mayagüez, April, 1904, G. P. Clinton 170, Cataño, Feb., 1914, J. R. Johnston 1364, and on *S. tenuior* at Campo Alegre, Dec., 1914, J. A. Stevenson 2459.

From other West Indian islands it has been gathered on *B. laevis* in Jamaica, L. M. Underwood, Jan. 1903, 83, March, 1903, 1736, on *E. littoralis* in New Providence, Bahamas, Nov., 1890, A. S. Hitchcock, on *Hemidiodia ocimifolia* in Cuba, March, 1903, E. W. D. Holway, on *S. tenuior* in Jamaica, Feb., 1891, R. Thaxter, and on *S. aspera* in Jamaica, Jan., 1891, A. S. Hitchcock.

68. PUCCINIA ROSEA (Diet. & Holw.) Arth. Bot. Gaz. 40:206.
 1905.

Aecidium roseum Diet. & Holw. Bot. Gaz. 24: 36. 1897.

Uredo Agerati Mayor, Mem. Soc. Neuch. Sci. 5: 595. 1913.

ON CARDUACEAE:

Ageratum conyzoides L., Villa Alba, Jan. 3, 112; Utuado,
 Nov. 8, 4395; Monte Agrillo, Nov. 14, 4714, 4754.

Eupatorium polyodon Urban, Barros, Jan. 2, 140.

The several collections show urediniospores only, and in the

absence of teliospores the specific assignment must necessarily be somewhat doubtful.

The only other West Indian material referred to this species comes from Cuba, and also shows only uredinia. It is on *Eupatorium villosum* Sw., a common roadside weed in that region. The rust, which appears to be abundant, has been seen from three localities. It was collected at Gebara, March, 1903, by E. W. D. Holway, at Santiago de las Vegas, April, 1906, by W. T. Horne 17, and occurs on a phanerogamic specimen in the N. Y. Bot. Garden from Cabanas Bay, collected March, 1912, by Britton & Cowell 12816.

69. PUCCINIA TAGETICOLA Diet. & Holw. Bot. Gaz. 24: 26. 1897.

ON CARDUACEAE:

Tagetes patula L., Maricao, Jan. 10, II, 200.

This common Mexican rust has not before been reported from the West Indies. The host here represented is the French marigold of the gardens, introduced into cultivation over three hundred years ago from Mexico.

70. PUCCINIA SYNEDRELLAE P. Henn. Hedwigia 37: 277. 1898.

Puccinia solida Berk. & Curt. Jour. Linn. Soc. 10: 356. 1869.

Not *P. solida* Schw. 1832.

Puccinia Emiliae P. Henn. Hedwigia 37: 278. 1898.

Dicaeoma cubense Kuntze, Rev. Gen. 3^o: 466. 1898.

Puccinia Tridacis Arth. Bull. Torrey Club 33: 156. 1906.

Puccinia Eleutherantherae Diet. Ann. Myc. 7: 354. 1909.

ON CARDUACEAE:

Eleutheranthera ruderalis (Sw.) Sch. Bip., Mayagüez, May 24, 1542; Aguada, Nov. 22, 5095.

Emilia sonchifolia DC., Hormigueros, Jan. 14, 212; Guayama, Aug. 28, 2899; Dec. 4, 5342; Yauco, Oct. 3, 3141; San German, Nov. 8, 5805.

Synedrella nodiflora (L.) Gaertn., Barros, Jan. 2, 130; Caguas, June 5, 2168; Cabo Rojo, June 11, 2185; St. Catalina, Aug. 28, 2733; Yauco, Oct. 3, 3228; Isabela, Oct. 22, 3736; Rosario, Oct. 27, 3830, without date,

4853; Alegrillo, Nov. 14, 4479; Lares, Nov. 22, 4839; San Sebastian, Nov. 22, 5200; Guayama, Dec. 4, 5418; Monte de Oro near Cayey, Dec. 3, 5675; Jajome Alto, Dec. 3, 5682; Utuado, Nov. 8, 5781; Guayanilla, Nov. 13, 5922.

Other Porto Rican collections of this species are as follows: On *Emilia sonchifolia*, Ponce, Jan., 1912, J. R. Johnston 202, Rio Piedras, June, 1912, and Dec., 1913, J. R. Johnston 456, 1190, Espinosa, Nov., 1914, J. A. Stevenson 2342; on *Synedrella nodiflora*, Rio Piedras, June, 1912, J. R. Johnston, 448, Trujillo Alto, Aug., 1913, J. R. Johnston 1041; and on *Eleutheranthera ruderalis*, Buena Vista, Jan., 1915, J. A. Stevenson 2509.

The species is common throughout the West Indies, as the following collections indicate: on *E. ruderalis*, eastern Cuba, 1856-7, Charles Wright (type of *Puccinia solida* B. & C.), Isle of Pines, Cuba, May, 1904, A. H. Curtis, and on phanerogamic specimens in the herbarium of the N. Y. Bot. Garden from Jamaica, June, 1897, A. Fredholm 3060, from St. Domingo, June, 1910, Pater Fuertes, 174, from Grenada, March, 1905, W. E. Broadway, and from Guadeloupe, 1893, Père Duss 3264; on *E. sonchifolia*, Jamaica, Jan., 1892, Lloyd 1082, Oct.-Nov., 1902, F. S. Earle 32, March, 1903, and Sept., 1906, L. M. Underwood 1737, 3168, 3352, Feb., 1915, E. W. D. Holway 221, Antigua, Feb. 13, Rose, Fitch & Russell 3315, Martinique, Aug., 1913, F. L. Stevens 2973, and on a phanerogamic specimen in N. Y. Bot. Garden from Grenada, 1904, W. E. Broadway; on *S. nodiflora*, Cuba, Aug., 1910, Britton, Earle & Gager 6272, Jamaica, Dec., 1890, A. S. Hitchcock, April, 1903, L. M. Underwood, Feb., 1915, E. W. D. Holway 218, Barbados, Oct., 1889, G. von Lagerheim (Sydow, Ured. 376), and on a phanerogamic specimen from Tortola, April-May, 1913, W. C. Fishlock 22.

The species has also been collected on *Tridax procumens* L. in Cuba, Nov., 1904, Baker & O'Donovan 4039, and on *Neuro-laena lobata* (L.) R. Br. in Cuba, March, 1903, E. W. D. Holway.

The identification of the host for the type material of *Puccinia solida* B. & C. was made by Dr. B. L. Robinson of the Gray Herbarium in 1910, who found it to be *Eleutheranthera ruderalis*.

71. *PUCCINIOSIRA PALLIDULA* (Speg.) Lagerh. Tromsö Mus.
Aarsh. 16: 122. 1894.

Aecidiella Triumphettae Ellis & Kelsey, Bull. Torrey Club 24:
208. 1897.

ON TILIACEAE:

Triumfetta rhomboidea Jacq., Santurce, Jan. 22, 256;
Mayagüez, Feb. 8, 282; Aguada, Nov. 22, 5099.

Triumfetta sp., Villa Alba, Jan. 3, 111; Mayagüez, May
3, 1163, 1180, June 13, 2217, Oct. 31, 3928, 3943;
Bayamon, May 21, 1883; Aibonito, June 5, 2134;
Maricao, Oct. 20, 3713; Rosario, Oct. 27, 3769; El
Gigante near Adjuntas, Dec. 15, 6022; River junction
below Utuado, 6059.

The other Porto Rican collections examined are on *T. Lappula* L., at Ponce, by A. A. Heller 6184, 1902, on *T. rhomboidea* Jacq., at Santurce, by Cook & Collins 292, at Mayagüez, by G. P. Clinton 173, 1904, and on *Triumfetta* sp., at Rio Piedras, by Johnston & Seaver 991a, 1913.

Material has also been examined from Guadeloupe, on *T. grandiflora*, Vahl., and from Jamaica on *T. semitriloba* L.

The species was gathered by Stevens at Caracas, Venezuela, July 15, 1913, on an undetermined species of *Triumfetta*.

The leaves of most species of *Triumfetta* are not distinguishable with certainty, and where inflorescence does not accompany the collection, specific determination of the host is usually impractical.

The transfer of the genus *Puccinosira* from the family *Uredinaceae* to the *Aecidiaceae* is based upon a number of considerations, among which the aecidioid peridium and the intercalary cells of the catenulate teliospores have had much weight.

Form-genus: **Aecidium.**

Probably all forms listed here belong to heteroecious species under *Aecidiaceae*.

72. *Aecidium favaceum* sp. nov.

Pycnia amphigenous, very numerous on discolored spots, 3–5 mm. across, minute, evident, subcuticular, 60–90 μ across, flattened; ostiolar filaments wanting.

Aecia hypophyllous, crowded in groups on the pycnial area, hemispherical, soon open; peridium about 0.3 mm. across, delicate and evanescent; peridial cells oblong, 12–16 by 22–26 μ , readily separating, the walls 3–5 μ thick, the inner slightly thicker and strongly verrucose, the outer smooth, aeciospores globoid or broadly ellipsoid, 15–20 by 16–25 μ ; wall nearly or quite colorless, 1.5–2 μ thick, minutely and closely verrucose.

ON EUPHORBIACEAE:

Phyllanthus nobilis (L. f.) Müll. Arg., San German, Jan. 16, 249, May 25, 1849, Dec. 12, 5832; Hormigueros, Oct. 13, 3226 (type).

Three species of *Aecidium* have already been named which are said to be on *Phyllanthus* sp. Type material of *Aecid. detritum* Thüm. from Brazil has been examined and found quite unlike the West Indian species in all important details. The descriptions of *A. Phyllanthi* P. Henn. from New Guinea, and of *A. luzoniense* P. Henn. from the Philippines, also seem very unlike the material in hand, judging from descriptions.

73. *AECIDIUM PASSIFLORICOLA* P. Henn. Hedwigia, 43: 168. 1904.

ON PASSIFLORACEAE:

Passiflora rubra L., Mayagüez, May 9, 1295.

This form has been collected on the same host at Mayagüez, P. R., April, 1904, by G. P. Clinton 65, and in Jamacia by L. M. Underwood, Jan. 1903, 82, April, 1903, 1746, and Sept., 1906, 3316

74. *AECIDIUM TOURNEFORTIAE* P. Henn. Hedwigia 34: 338. 1895.

ON BORRAGINACEAE:

Tournefortia hirsutissima L., Yauco, Oct. 3, 3127; Rosario, Oct. 27, 3781.

The type collection was made in Brazil. It is here reported for North America for the first time.

75. *AECIDIUM TUBULOSUM* Pat. & Gaill. Bull. Soc. Myc. Fr. 4: 97. 1888.

Aecidium Uleanum Paz. Hedwigia 31: 95. 1892.

Aecidium solaniphilum Speg. An. Mus. Nac. Hist. Nat. Buenos Aires 23: 34. 1912.

ON SOLANACEAE:

Solanum torvum Sw., Mayagüez, May 10, 1912, 1, 2, Jan. 30, 294bis (Barth. Fungi Columb. 4202); Corozal, Feb. 21, 403; Yauco, Oct. 3, 3131; Rosario, Oct. 27, 3776; El Gigante near Adjuntas, Dec. 15, 4491; Maricao, Nov. 18, 4807; Lares, Nov. 22, 4844; Adjuntas, Nov. 22, 4969; Jajome Alto, Dec. 3, 5688; Monte de Oro near Cayey, Dec. 3, 5733; Jayuya, Dec. 17, 6045a; Cabo Rojo, Dec. 27, 6483.

A common and conspicuous rust, which is probably heteroecious. Other Porto Rican collections are on the same host; they are without locality, Geo. P. Goll 456, 1899, Underwood & Griggs 26, 1901, from near Santurce, A. A. Heller 1296, 1899, from Mayagüez, G. P. Clinton 72, 1904, from San Juan, E. W. D. Holway, 1911, and from Rio Piedras, H. B. Cowgill 503, 1912. It has also been collected in Jamaica, Dec., 1890, by A. S. Hitchcock, and in Cuba, March, 1903, by E. W. D. Holway.

The type material of *A. solaniphilum* examined, kindly supplied by Dr. Spegazzini, resembles the other specimens in gross appearance of both fungus and host. The microscopic characters also agree, except that the peridial cells seem somewhat smaller and more delicate.

(To be continued)